

Navigating between Drug Classes and RxNorm Drugs with RxClass

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Abstract: *RxClass* is a web-based, interactive browser and companion application programming interface (API) to explore the relationships between RxNorm drugs and drug classes from several sources including ATC, MeSH and NDF-RT. Like *RxNav*, *RxClass* is publicly available at: <http://rxnav.nlm.nih.gov/>

System Description:

RxClass supports the following drug classification systems:

- The Anatomical Therapeutic Chemical drug classification (**ATC**) is a resource developed for pharmacoepidemiology purposes by the World Health Organization Collaborating Centre for Drug Statistics Methodology.
- The Medical Subject Headings (**MeSH**), developed by the National Library of Medicine (NLM), provides a rich description of pharmacological actions for the purpose of indexing and retrieval of biomedical articles.
- The National Drug File-Reference Terminology (**NDF-RT**), developed by the Department of Veterans Affairs, provides clinical information about drugs and contains the following class types: FDA Established Pharmacologic Classification (EPC), Disease classification, Chemical Structure and Classification (Chem), Mechanism of Action (MoA), Physiologic Effects (PE) and Pharmacokinetics (PK) class types.

ATC and MeSH provide both the vocabulary for drug classes and the drug-class membership relations. In contrast, several sources - DailyMed, FDASPL and NDF-RT - provide drug-class membership relations in reference to the NDF-RT vocabulary for classes. All drugs are normalized to RxNorm.

RxClass provides a graphical interface to explore the hierarchical class structures of each source and examine the corresponding RxNorm drug members for each class. Some features of *RxClass*:

- The user can navigate through the drug classes via the hierarchical menu (left pane), or use the search feature to identify a drug class or RxNorm drug (top search bar). *RxClass* contains an autocomplete function which will help identify class or drug names in search mode, as well as spelling suggestions for misspelled drug and class names during search.
- Selecting a class displays the list of its drug members in a table (main area), showing their identifiers and names in both RxNorm and the original classification system.
- *RxClass* supports the exploration of all classes for a given drug across multiple classifications (All/classes/Show button).
- *RxClass* provides a list of similar classes based on drug membership to the selected class. Users can select a class from the list and view a detailed table listing the drug members of each class with a Venn diagram highlighting the overlapping members.

Companion API. *RxClass* is supported by functions from an application programming interface (API), which can be used independently for integrating drug class information in programs. The API serves the latest information available from the drug information sources. The RxClass API can interoperate with the RxNorm API. The demonstration will include examples of using the API to mimic the functionality displayed in *RxClass*.

RxClass has been operational since July 2014. From October 2014 through June 2015 *RxClass* has received an average of 1254 queries per month. The drug information sources are updated monthly. The RxClass API has been operational since September 2014. *RxClass* supports the analysis of medication datasets with different drug classification systems, as well as the analysis of medication value sets in reference to drug classes.

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